

CLAIMS

1 1. A digital camera system having a digital camera and a computer for transferring  
2 pictures of images taken by the digital camera therebetween comprising:

3 a card removably and directly coupled, without any intermediary device, between the  
4 digital camera and the computer for temporarily storing the images by the digital camera and  
5 for transferring the temporarily stored images to the computer for viewing, editing and  
6 reproduction thereof.

1 2. A digital camera system as recited in claim 1 wherein the card is removably coupled to  
2 the computer for transferring the images in a serial fashion to the computer.

1 3. A digital camera system as recited in claim 2 wherein the card is removably coupled to  
2 the computer for transferring the images using a Universal Serial Bus (USB) interface.

1 4. A digital camera system as recited in claim 3 wherein the card is removably coupled to  
2 the digital camera for transferring the images, in digital and parallel fashion.

1 5. A digital camera system as recited in claim 4 wherein the card is removably coupled to  
2 the digital camera for transferring the digital parallel images using a PCMCIA/CF interface.

1 6. A digital camera system as recited in claim 5 wherein the card includes an interface  
2 module for receiving the digital parallel images through the PCMCIA/CF interface and  
3 converting the same to the serial digital images for transfer thereof to the computer.

1 7. A digital camera system as recited in claim 6 wherein the transfer of the serial digital  
2 images is performed pursuant to the Universal Serial Bus (USB) standard.

000020:55200560

1 8. A digital camera system as recited in claim 7 wherein the card further includes flash  
2 memory coupled to the PCMCIA/CF interface and the interface module for temporarily  
3 storing the digital images.

1 9. A digital camera system as recited in claim 8 wherein the card further includes a  
2 common logic block for transferring the digital images between the flash memory and the  
3 PCMCIA/CF interface and for further transferring the digital images between the interface  
4 module and the flash memory.

1 10. A digital camera system as recited in claim 9 wherein the common logic block is  
2 shared between the PCMCIA/CF interface and the interface module thereby avoiding  
3 duplication of the common logic block.

1 11. A digital camera system as recited in claim 10 wherein the common logic block  
2 includes a microcontroller block for processing information received from the computer,  
3 through the interface module, and the digital camera, through the PCMCIA/CF interface, the  
4 common logic block further including a data buffer for temporarily storing digital images  
5 retrieved from the flash memory, a task file for storing commands received from the digital  
6 camera and the computer, and a CIS RAM/ROM for storing identification information.

1 12. A digital camera system as recited in claim 11 wherein the interface module includes  
2 an application interface for initiating communication between the computer and the  
3 microcontroller.

1 13. A digital camera system as recited in claim 12 wherein the USB standard is defined to  
2 include a first mode of application specifying a first data transfer mode and a second mode of  
3 application specifying a second data transfer mode, the interface module including a USB  
4 engine coupled to computer and the application interface wherein the USB engine operates to

5 accommodate said first and second modes of application without the need for any  
6 modifications to the card.

1 14. A digital camera system as recited in claim 13 wherein the first mode of application is  
2 ATA and the second mode of application is bulk-only mass storage class.

1 15. A digital camera system as recited in claim 14 wherein the interface module further  
2 includes a transceiver coupled between the computer and the USB engine for converting  
3 digital images to analog images for transfer to the computer and for further converting analog  
4 images to digital images for transfer to the digital camera, the interface module further  
5 includes a serial interface engine for converting digital images in serial fashion to digital  
6 images in parallel fashion and for further converting digital images in parallel fashion to  
7 digital images in serial fashion.

1 16. A digital camera system as recited in claim 1 wherein the computer includes a screen  
2 viewable by a user of the computer wherein an icon is shown thereupon when the card is  
3 coupled to the computer and the icon is not shown on the screen when the card is removed  
4 from the computer.

1 17. A card for use in a digital camera system, the digital camera system having a digital  
2 camera and a computer for transferring pictures of images taken by the digital camera between  
3 the digital camera and the computer comprising:

4 a controller for controlling the transfer of images between the digital camera and the  
5 computer by transferring images, in digital format, to the digital camera through a first  
6 interface and for transferring the images to the computer through a second interface; and

7 flash memory for temporarily storing the images, wherein the card is removably and  
8 directly coupled, without any intermediary device, between the digital camera and the  
9 computer for temporarily storing the images and for transferring the temporarily stored images  
10 to the computer for viewing, editing and reproduction thereof.

1 18. A card for use in a digital camera system as recited in claim 17 wherein the first  
2 interface is a PCMCIA/CF interface and the second interface is a USB interface.

1 19. A card for use in a digital camera system as recited in claim 18 wherein the controller  
2 includes a first interface module for causing communication between the card and the digital  
3 computer through the PCMCIA/CF interface, a second module for causing communication  
4 between the card and the computer through the USB interface and a third module coupled to  
5 the first and second modules for causing images to be transferred to the flash memory.

1 20. A card for use in a digital camera system as recited in claim 19 wherein the computer  
2 includes a screen viewable by a user of the computer, the card for causing an icon to be shown  
3 on the screen when the card is coupled to the computer and for further causing the icon not to  
4 be shown on the screen when the card is removed from the computer.

1 21. A card for use in a digital camera system as recited in claim 19 wherein the card  
2 further includes a common logic block for transferring the digital images between the flash  
3 memory and the first module and for further transferring the digital images between the  
4 second module and the flash memory, wherein the common logic block is shared between the  
5 first module and the second module thereby avoiding duplication of the common logic block.

1 22. A card for use in a digital camera system as recited in claim 21 wherein the common  
2 logic block includes a microcontroller block for processing information received from the  
3 computer, through the second module, and information received from the digital camera,  
4 through the PCMCIA/CF interface, the common logic block further including a data buffer for  
5 temporarily storing digital images retrieved from the flash memory, a task file for storing  
6 commands received from the digital camera and the computer, and a CIS RAM/ROM for  
7 storing identification information.

1 23. A card for use in a digital camera system as recited in claim 22 wherein the USB  
2 standard is defined to include a first mode of application specifying a first data transfer mode  
3 and a second mode of application specifying a second data transfer mode, the interface  
4 module including a USB engine coupled to computer and the application interface wherein the  
5 USB engine operates to accommodate said first and second modes of application without the  
6 need for any modifications to the card.

1 24. A card for use in a digital camera system as recited in claim 23 wherein the first mode  
2 of application is ATA and the second mode of application is bulk-only mass storage class.

1 25. A card for use in a digital camera system as recited in claim 24 wherein the second  
2 module further includes a transceiver coupled between the computer and the USB engine for  
3 converting digital images to analog images for transfer thereof to the computer and for further  
4 converting analog images to digital images for transfer thereof to the digital camera, the  
5 second module yet further includes a serial interface engine for converting digital images in  
6 serial fashion to digital images in parallel fashion and for further converting digital images in  
7 parallel fashion to digital images in serial fashion.

1 26. A method of transferring pictures of images taken by the digital camera between a  
2 digital camera and a computer comprising:  
3 providing images in digital format to the digital camera through a first interface;  
4 temporarily storing the digital images in flash memory; and  
5 transferring the stored images to the computer through a second interface directly and  
6 without any intermediary device, between the digital camera and the computer.